HGCA Fungicide Performance in Wheat

2009 - 2010
2009 *Septoria tritici* – product / a.i. list

<table>
<thead>
<tr>
<th></th>
<th>Active Ingredient</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>epoxiconazole</td>
<td>Opus</td>
</tr>
<tr>
<td>2</td>
<td>chlorothalonil</td>
<td>Bravo</td>
</tr>
<tr>
<td>3</td>
<td>prothioconazole</td>
<td>Proline</td>
</tr>
<tr>
<td>4</td>
<td>epoxiconazole + metconazole</td>
<td>Brutus</td>
</tr>
<tr>
<td>5-8</td>
<td>experimental products</td>
<td>confidential</td>
</tr>
</tbody>
</table>
S. tritici – understanding the data

On each site, at each disease assessment, each leaf layer was assessed and categorised as:
  • Eradicant,
  • Protectant,
  • Mixed.

• At SAC and Teagasc
  - Dose response data for T2 applications only

• At Rosemaund and Andover
  - Dose responses from T1 and T2 - kept separate, for comparison
Overall (mainly T2) - eradicant 2009

% S. tritici

Dose (proportion of full label rate)
Overall - protectant 2009

% S. tritici

Dose (proportion of full label rate)

- Opus
- Bravo
- Proline
- Brutus

RM 5
AS 3
TG 1
ES 2
Overall - mixed activity 2009

% S. tritici

Dose (proportion of full label rate)
Half label rates at T1 and T2
(Average of all S. tritici sites)

<table>
<thead>
<tr>
<th></th>
<th>Untreated</th>
<th>Opus</th>
<th>Bravo</th>
<th>Proline</th>
<th>Brutus</th>
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<tbody>
<tr>
<td>Yield</td>
<td>10</td>
<td>9</td>
<td>9.5</td>
<td>9</td>
<td>8.5</td>
</tr>
<tr>
<td>S. tritici</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>7</td>
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</tbody>
</table>
Yield response (all *S. tritici* sites)

![Yield response graph](image)
Proportion of control from Opus 0.5 l/ha
2008 + 09 combined analysis
*S. tritici* protectant activity

![Graph showing the % S. tritici vs Dose (proportion of label rate) for different treatments: Opus, Bravo, Proline, and Brutus.](image-url)
2008 + 09 combined analysis
*S. tritici* eradicant activity

- Opus
- Bravo
- Proline
- Brutus

Dose (proportion of label rate)

% *S. tritici*
2008 + 09 combined analysis
*S. tritici* overall (eradicant and protectant)
Does timing affect the rank order of activity?

(2008 + 09 combined analysis)

T1 eradicanent

T2 eradicanent

% S. tritici

Dose (proportion of label rate)

Dose (proportion of label rate)
S. tritici 2008 + 2009 - Matched for units of azole
Protectant

% Septoria tritici

units of azole applied

Opus
Brutus

1.5l/ha Brutus
1.0l/ha Opus
S. tritici 2008 + 2009 - Matched for units of azole Eradicant

% Septoria tritici

units of azole applied
## 2009 Rust & Mildew trials

<table>
<thead>
<tr>
<th>Disease</th>
<th>Location</th>
<th>Variety</th>
<th>Fungicide Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow Rust</td>
<td>ADAS Norfolk</td>
<td>Robigus</td>
<td>Half dose at T1 (leaf 3, GS32)</td>
</tr>
<tr>
<td>Brown Rust</td>
<td>TAG Bedfordshire</td>
<td>Hereford</td>
<td>Dose response at T2 (flag leaf emerged, GS37-39)</td>
</tr>
<tr>
<td>Mildew</td>
<td>SAC Fife</td>
<td>Claire</td>
<td>Half dose T1 – T2 sequence</td>
</tr>
</tbody>
</table>
Yellow rust

In 2009
New races, virulent on several varieties
A significant epidemic despite frosts
Increased aggressiveness?

In 2010
Over 25% of the UK cropping area rated 4 or less for YR.
Inoculum not likely to limit disease progress.
Overwinter frosts will determine earliness of the epidemic.
ADAS Yellow rust – 2009
(application at leaf 3 emerged)
Brown rust

In 2009

A late season epidemic,
due to average winter temperatures

In 2010

• Brown rust ~ 60% of varieties are susceptible
  • Already been seen in crops in the south (Crop monitor)

• Winter temperatures likely to determine earliness of the epidemic.
TAG Brown rust 09
(application at leaf 1 emerged)
TAG Brown rust
2008 and 09

% Brown rust

- Opus
- Proline
- Brutus
- FireFly
- Comet

0 0.5 1 1.5 2
Powdery Mildew

In 2009
Favoured by:
• Later sowings
• Rapid lush spring growth,
• Low frequency of rainfall

In 2010
• Being found widely this autumn
• Significance likely to depend on spring conditions
Half label rates at T1 and T2 – mildew 2009
(Yield effects due to S. tritici and mildew)
Powdery Mildew – 4 year analysis

- Proline
- Tern
- Flexity
- Torch
- Talius
- Cyflamid

% Mildew

0 0.5 1 1.5 2
2009 Key messages for S. tritici

- Comparable field performance of Opus and Proline in 2009

- Following decline in performance in the 90’s, no evidence of a shift in the field performance of Opus or Proline since 2001

- Half rate Brutus was as good as full rate Opus, despite having a lower azole content

- We have tested new products that showed up to 80% control in eradicant situations, over 90% control in protectant situations, and 5-10% better yield than average of Opus/Proline

- The rank order of products at T1 is similar to the order at T2

- Bravo – still a very effective protectant fungicide
2009 Key messages for Rusts and Mildew

Brown rust - protectant activity
- Triazole rank order: Brutus > Opus > Proline
- New products will provide new modes of action and levels of control equal to or better than the triazoles
- Strobilurins still remain effective

Yellow rust - eradicant activity
- Triazole rank order Opus/Brutus > Proline
- New products will provide new modes of action with efficacy on yellow rust
- Strobilurins still remain effective

Mildew
- Several different modes of action still show good control of mildew
HGCA Fungicide Performance in Barley

2009 - 2010
### 2009 - Fungicides tested

<table>
<thead>
<tr>
<th>Product name</th>
<th>Active Ingredient</th>
</tr>
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<tbody>
<tr>
<td>Amistar</td>
<td>azoxystrobin</td>
</tr>
<tr>
<td>Bravo</td>
<td>chlorothalonil</td>
</tr>
<tr>
<td>Comet</td>
<td>pyraclostrobin</td>
</tr>
<tr>
<td>Cyflamid</td>
<td>cyflufenamid</td>
</tr>
<tr>
<td>Fandango</td>
<td>fluoxastrobin + prothioconazole</td>
</tr>
<tr>
<td>Flexity</td>
<td>metrafenone</td>
</tr>
<tr>
<td>Fortress</td>
<td>quinoxyfen</td>
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<tr>
<td>Galileo</td>
<td>picoxystrobin</td>
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<tr>
<td>Kayak</td>
<td>cyprodinil</td>
</tr>
<tr>
<td>Opus</td>
<td>epoxiconazole</td>
</tr>
<tr>
<td>Proline</td>
<td>prothioconazole</td>
</tr>
<tr>
<td>Talius</td>
<td>proquinazid</td>
</tr>
<tr>
<td>Torch extra</td>
<td>spiroxamine</td>
</tr>
<tr>
<td>Tracker</td>
<td>epoxiconazole + bosalid</td>
</tr>
</tbody>
</table>
Winter Barley Yield

WB2009 Summary - Grain Yield

- Proline
- Opus
- Tracker
- Fandango
- Comet

Yield 15%MC-t/ha vs. Dose

- Torch extra
- Flexity
- Talius
- Cyflamid
- Proline

Dose 0.0 0.2 0.4 0.6 0.8 1.0

Yield 15%MC-t/ha 7.0 7.5 8.0 8.5 9.0
Winter Barley Specific Weight

![Graphs showing specific weight vs dose for different barley varieties.]

- Proline
- Opus
- Tracker
- Fandango
- Comet

Graphs illustrating the specific weight (kg/hl) against dose for various barley varieties. The specific weight range is from 59.5 to 62.0 kg/hl, and the dose range is from 0.0 to 1.0.
Winter Barley Rhynchosporium: Protectant

WB2009 Summary - Rhynchosporium Protection

![Graph showing the percentage of Rhynchosporium protection against different doses of Proline, Opus, Fandango, and Comet.](image-url)
Winter Barley Rhynchosporium: Eradicant
Winter Barley Mildew: Eradicant

WB2009 Summary - Mildew Eradication

- Proline
- Opus
- Tracker
- Comet

Mildew %

Dose
Winter Barley Brown Rust: Protectant

WB2009 Summary - Brown Rust Protection

Brown Rust %

Dose

- Proline
- Flexity
- Talius
- Cyflamid
- Torch extra
Winter Barley Brown Rust: Eradicant

WB2009 Summary - Brown Rust Eradication

Brown Rust %

Dose

Proline
Flexity
Talius
Cyflamid
Torch extra
Winter Barley Net Blotch: Protectant

WB2009 Summary - Net Blotch Protection

- Proline
- Opus
- Tracker
- Comet

Net Blotch % vs Dose

Dose

0.0 0.2 0.4 0.6 0.8 1.0
Winter Barley Net Blotch: Eradicant

WB2009 Summary - Net Blotch Eradication

- Proline
- Opus
- Tracker
- Comet

Net Blotch % vs Dose
Winter Barley Late Green Leaf Area

WB2009 Summary - Late Green Leaf Area

- Proline
- Opus
- Tracker
- Fandango
- Comet

Green Leaf Area % vs Dose

- Proline
- Flexity
- Talius
- Cyflamid
- Torch extra

0.0 0.2 0.4 0.6 0.8 1.0

0.0 0.2 0.4 0.6 0.8 1.0

0.0 0.2 0.4 0.6 0.8 1.0
Winter Barley Yield Rhynchosporium Trials

WB2009 Summary - Grain Yield - Rhynchosporium Trials

Yield 15%MC-tha

Dose

- Proline
- Opus
- Fandango
- Comet
Winter Barley Yield Mildew Trials

WB2009 Summary - Grain Yield - Mildew Trials

Yield 15%MC/ha vs Dose

- Proline
- Flexity
- Talius
- Cyflamid
- Torch extra
Winter Barley Yield Net Blotch Trials

WB2009 Summary - Grain Yield - Net Blotch Trials

Yield 15%MC-t/ha

Dose

- Proline
- Opus
- Tracker
- Fandango
- Comet
Spring Barley Yields
Spring Barley Specific Weight

SB2005-9 Summary - Specific Weight

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar

<table>
<thead>
<tr>
<th>Dose</th>
<th>Proline</th>
<th>Opus</th>
<th>Tracker</th>
<th>Fandango</th>
<th>Bravo 500</th>
<th>Comet</th>
<th>Amistar</th>
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<tbody>
<tr>
<td>0.0</td>
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</tbody>
</table>
Spring Barley Brown Rust: Protectant

SB2005-9 Summary - Brown Rust Protection

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500

Brown Rust % vs. Dose
Spring Barley Ramularia: Protectant

SB2005-9 Summary - Ramularia Protection

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar

Dose vs. Ramularia %
Spring Barley Abiotic Leaf Spot Protection

SB2005-9 Summary - Abiotic Spot Protection

Abiotic Spot %

Dose

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar
Spring Barley Early Green Leaf Area

SB2005-9 Summary - Early Green Leaf Area

Graph showing the percentage of green leaf area (%) against dose for different varieties:
- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar

Axes:
- Y-axis: Green Leaf Area %
- X-axis: Dose

Legend:
- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar

Graph indicates the variability in green leaf area across different doses and varieties.
Spring Barley Late Green Leaf Area

SB2005-9 Summary - Late Green Leaf Area

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar
Spring Barley Thousand Grain Weight

SB2005-9 Summary - TGW - g

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar

Dose

TGW - g
Spring barley % Screenings (2.5 mm)

SB2005-9 Summary - % Screenings

- Proline
- Opus
- Tracker
- Fandango
- Bravo 500
- Comet
- Amistar